

"FAST FIT BOTTLE MOUNT"**TECHNICAL FIELD**

The present invention relates, *inter alia*, fast fit assemblies such as might be used in
5 dispensing apparatus of a kind capable of dispensing liquid to be drawn from a replaceable
container.

BACKGROUND

New Zealand Patent Specification 173753 discloses a dispensing apparatus capable of
dispensing liquid drawn into a variable volume chamber from a replaceable container. It is to
10 be noted that in NZ173753 a bottle is placed in the docking and a collar *is rotated* to urge
inwardly cam followers or plungers to engage the under face of the neck flange of the bottle.
Such retention can be reversed by appropriate rotation of the collar reliant on springs to urge
outwardly the cam followers.

Our PCT/NZ01/00150 (published as WO 01/14208) is directed to a different form of
15 quick fit engagement of a bottle or other replaceable container of the liquid to be expressed
from the apparatus. This recognises an advantage in a quick push on fit without further fuss
to achieve the appropriate location of the replacement container in a docking as well as the
penetration of its penetrable end by an intake needle. A simple operator activated release
mechanism is the basis for removal of the emptied container from the docking. Preferably
20 this, in the preferred form, simply comprises a movement of a couple of actuating wings
which removes retention shoulders from the under face of the neck flange i.e. it is to these
types of quick fit arrangements that the present invention is directed.

The present invention relates to an alternative to such arrangements and to related
components, sub-assemblies and assemblies. It is believed the apparatus methodology of the
25 present invention will provide the public with a useful choice.

SUMMARY OF THE INVENTION

In a first aspect the present invention consists in a **fast fit assembly** adapted to dock a
necked container *characterised in that* the assembly includes a resilient (preferably moulded)
collar which includes an array of elements, each with a form to be moved outwardly radially
30 against a bias as a container is being axially docked until each moves inwardly radially with
the bias to capture (at least in part) a neck flange or the equivalent of the container (hereafter
"head") by its underface, each said element being integral with and/or supported by linking
regions, there being in the (preferably moulded) collar sufficient deformability to allow both

the docking movement as aforesaid and to allow a docked container to be moved free from the elements.

Preferably the moulded unit is of a kind having elements and/or a ring form and/or a ring form/element inter-relationship substantially as hereinafter described with reference to
5 any one or more of the accompanying drawings. For example, preferably the collar preferably has linking regions for each of said elements such that each region can be supported against a surround and each such region can be urged by forces on the element to deform outwardly (preferably at least the region with which it is associated with the element).

Preferably this is achieved by the region curving inwardly.

10 Preferably the docking collar is associated with a shroud, housing, barrel or other surround having (preferably resilient) fingers or other means capable of supporting in part the body region of a necked container of a range of sizes.

In a further aspect the present invention consists in a **fast fit assembly** for association with dispensing apparatus, said assembly including

15 a member or assembly defining a shroud, housing or the like (hereafter "housing") adapted to receive an axially advanced necked container from one end towards the end thereof ("the attachment end") to be associated directly or indirectly with the dispensing apparatus, and

20 at or adjacent the attachment end, a container neck and/or head retention collar having a plurality of retention elements each supported so as to be resiliently outwardly moveable under forces applied thereto during the insertion or removal of the necked container.

Preferably each said element includes a configuration adapted to retain, at least in part, a flange or head of the necked container by an underface to hold the same in retention in the assembly.

25 Preferably said collar is a unitary moulded member. In other forms it can be an assembly of components

Preferably said collar is at least primarily located in an annular cavity of the housing.

Preferably at least part of each said element extends radially inwardly through a wall which in part defines said annular cavity.

30 Preferably the docking collar is associated with a shroud, housing, barrel or other surround having (preferably resilient) fingers or other means capable of supporting in part the body region of a necked container of a range of sizes.

Preferably the apparatus is substantially as hereinafter described.

In yet a further aspect the present invention consists in, **as a moulded item**, a shroud or housing member substantially as hereinafter described with reference to the accompanying drawings.

5 In still a further aspect the present invention consists in **a collar retention ring** substantially of a form as hereinafter described with reference to any one or more of the accompanying drawings irrespective of whether or not the same is a unitary moulded member or not.

10 In still a further aspect the present invention consists in **an assembly** which includes a collar retention ring or the like, being an assembly substantially as hereinafter described with reference to any one or more of the accompanying drawings.

In another aspect the present invention consists in **a dispensing apparatus** to dispense a liquid to be drawn from a replaceable necked container of a kind having a head (i.e. neck flange),

said apparatus having

15 a docking into which a suitable said container can be substantially axially advanced and push engaged and retained thereby (alone or with other retention capability as well) and from which such a suitable container can be disengaged by a prying and/or pulling movement of said suitable container relative to the docking, said docking having a retention collar to surround the container neck and/or head with retention elements thereof capable of in part
20 contacting and/or in part underlying the underface of the head when a container is properly docked, said elements being movable outwardly against their resilience and/or resilience of collar links between such elements,

an intake needle or other conduit adapted to penetrate into a suitable said container as it is being and/or when docked by said docking, and

25 a chamber of variable volume capable of being varied as to volume by an operator of the apparatus

- (i) to draw liquid via said intake needle or other conduit into said chamber as it is enlarged from a said docked container into which said needle or other conduit penetrates in use and
- 30 (ii) to express previously drawn in liquid from said chamber via an outlet from said chamber as the chamber is reduced in volume.

In another aspect the present invention consists in **a dispensing apparatus** to dispense a liquid to be drawn from a replaceable necked container of a kind having a head (i.e. neck flange),

said apparatus having

a docking assembly into which a suitable said container can be substantially axially advanced and push engaged and retained (at least in part by such interaction) and from which such a suitable container can be disengaged by a prying and/or pulling movement of said
5 suitable container relative to the docking, said docking having (preferably a moulded) retention collar to surround the container neck and/or head with retention elements thereof capable of (at least in part) contacting and/or (at least in part) underlying the underface of the head when a container is properly docked, said elements being movable outwardly (preferably against reactive forces from other part(s) of the docking assembly) against at least resilience
10 of collar links between such elements,

an intake needle or other conduit adapted to penetrate into a suitable said container as it is being and/or when docked by said docking, and

a chamber of variable volume capable of being varied as to volume by an operator of the apparatus

- 15 (i) to draw liquid via said intake needle or other conduit into said chamber as it is enlarged from a said docked container into which said needle or other conduit penetrates in use and
- (ii) to express previously drawn in liquid from said chamber via an outlet from said chamber as the chamber is reduced in volume.

20 Preferably said variable geometry chamber takes the form of a barrel or cylinder, the volume of which is variable under the action of a piston.

Preferably said piston is directly operable using a hand operated means of actuation e.g. a trigger, squeezable handle or the like with a bias return.

25 Preferably said outlet from said variable geometry chamber is or is in communication with an outlet nozzle, catheter, skin penetrating needle, skin scratch needle or other like device.

Preferably the docking collar is associated with a shroud, housing, barrel or other surround having (preferably resilient) fingers or other means capable of supporting in part the body region of a necked container of a range of sizes.

30 Preferably said dispensing apparatus is of a kind substantially as hereinafter described with or without reference to any one or more of the accompanying drawings.

In still a further aspect the present invention consists in, **in an assembly for docking a container** (preferably a necked container), **the use** of a retention collar to surround at least

part of the container as it is being docked and when docked such that the collar retains, at least in part, the container.

Preferably said collar is resilient at least in part.

5 Preferably said collar includes elements each of which is to contact the container as it is being docked.

In a further aspect the present invention consists in, **in combination**, dispensing apparatus as previously defined and a said replaceable suitable (preferably necked) container.

Preferably said combination is assembled with said intake needle or other conduit penetrating a needle penetrable seal of said replaceable container.

10 Preferably said replaceable container is in the form of a bottle (glass, metal or plastic) having a neck leading to a retention head or rib about the mouth thereof.

Preferably the docking means is such as to provide for a clip fit engagement of retention members behind said head or rib on opposite sides of the container to hold the same docked in use.

15 Preferably the apparatus is such that at least part of said docking is associable by an engagement with and thus is dissociable from the remainder of said dispensing apparatus, e.g. by a screw thread engagement.

In some preferred forms of the present invention, particularly with containers of a larger volume and thus weight, a mere resilient retention by a unitary or assembled retention
20 ring may provide insufficient purchase to ensure a stable support of the full container even in conjunction with outwardly applied location fingers of the shroud, housing, barrel or the like and in some circumstances therefore a manually actuable retention feature derived from our variant as disclosed in our aforementioned WO 01/14208 might additionally be appropriate. For this purpose therefore the full content of that specification is hereby here included by way
25 of reference.

In still a further aspect the present invention consists of **apparatus** suitable for retro fitting or association with a dispensing apparatus to provide the docking and/or retention collar of apparatus as previously defined.

30 In another aspect the invention is a **moulding or mouldings** having some or all of the features of retention/release/association importance shown in any one of the accompanying drawings.

In still a further aspect the present invention consists in a **docking** substantially as hereinafter described with reference to any one or more of the accompanying drawings.

In still a further aspect the present invention consists in a **method of dispensing a liquid** which comprises

engaging so as to dock a source of said liquid in a replaceable necked container with an integral retention head with a retention collar of dispensing apparatus so as to allow a draw
5 off needle or other conduit to penetrate the container,

dispensing liquid drawn from said replaceable container via said needle or other conduit from the apparatus, and

thereafter forcibly removing the container with a reduced or depleted liquid content from the dispensing apparatus.

10 In still a further aspect an assembly for docking a complementary container, said assembly having beyond a container locator a container head retention collar deformable outwardly to allow a clip fit retention against removal without deformation of the collar.

Preferably the retention collar is integrally moulded yet has localised regions, each carrying a retention element capable of being pressed and/or twisted outwardly to allow said
15 clip fit.

As used herein "and/or" means "and" or "or", or, if the context allows, both.

As used herein "9s)" following a noun means either or both the singular and plural forms of the noun.

To those skilled in the art to which the invention relates, many changes in construction
20 and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the descriptions herein are purely illustrative and are not intended to be in any sense limiting.

The invention consists in the foregoing and also envisages constructions of which the
25 following gives examples.

One preferred form of the present invention will now be described with reference to the accompanying drawings in which;

BRIEF DESCRIPTION OF DRAWINGS

30 **Figure 1** is a an exploded perspective view of a docking assembly of the present invention showing from the right a docking housing which defines an annular cavity at least in part to locate the preferably unitary moulded collar retention ring, the collar retention ring itself, and a base associable by welding adhesion or other inter-engagement with the docking housing so as to confer a screw thread engagability thereof with a suitable applicator

apparatus (such as any of those disclosed in the aforementioned patent specifications, the full content of which is hereby included by way of reference) and

Figure 2 is the apparatus of **Figure 1** in its assembled form with an appropriately necked container located resiliently therein and from which it can be pulled.

5 DETAILED DESCRIPTION

In the preferred form of the present invention a docking housing 1 is provided having a collar retention ring 6 and an end 3 into which a container such as 18 can be inserted. The container has a neck region 4 and a neck flange or head or other formation 5 to be docked and retained by the collar retention ring 6.

10 The overall assembly being seen includes not only the collar retention ring 6 but also a threaded base member 7 having threads 8 adapted for attaching the overall assembly as in **Figure 2** to the male thread of a dispensing apparatus when attached the dispensing apparatus will present a needle or conduit into the penetratable region 9 of the container 3 when it is held in position as in **Figure 2**.

15 Shown in **Figure 1** is the annular cavity 10 into which the retention ring 6 is receivable such that parts 11 thereof (the elements) in part protrude out of gaps 12 so as to be contactable as shown in **Figure 2** with the head or flange region 5 of the necked container.

Each such element includes a retention region 13 to underlie the face (curving, angled and/or otherwise) of the head 5 of the container 3.

20 Linking regions 14 each support an element such that the inward bowing of each linking region in part prior to reaching a node or the like commencement of a second bowing to another element provides sufficient resilience when the material (being a suitable plastics) is utilised.

25 The provision of the region 15 is such that it bears against the outer wall defining the cavity 10 so that the docking member 1 itself provides a reactive force in the inward direction to counter the camming pressure from a container being inserted so as to ensure the resilient retention thereof.

Resistance to axial forces on the member 6 is forthcoming from the placement of the end base member 7.

30 Persons skilled in the art will appreciate how other features can be incorporated in the structure including for example, flexible fingers 16 to assist in the location of the main body of a container 3 whilst it is retained.

The components are preferably moulded in any of several suitable resilient plastics materials (e.g. a polycarbonate).